HW due Tuesday (meaning Monday 2ND period)

2.4/10-13, 17-20, 31-32, 41

2.3/43

$$\lim_{x\to b} \frac{(x-b)^{50}+(-x+b)}{(x-b)}$$

$\frac{0}{0}$ does not mean "0"

$$= \lim_{x\to b} \frac{(x-b)^{50}}{(x-b)} + \frac{-x+b}{x-b}$$

$\frac{0}{0}$ does NOT mean DNE

$$= \lim_{x\to b} (x-b)^{49} + -1$$

$\frac{0}{0}$ means IDK

$$= 0 + -1 = -1$$

$$\frac{-x+b}{x-b} = -1$$

$$x-b \;\overline{)\; -x+b}$$

$$-1$$

$$-(-x+b)$$

0 = remainder

strategies for evaluating limits

* substitute

strategies to simplify/change form of limit

* factor & cancel

* multiply by conjugate

23/81

$\lim_{x \to 1} f(x) = 0$ $\lim_{x \to 1} (f(x)g(x)) = 5$

$f(x) = x - 1$ $g(x) = \frac{5}{x-1}$

$(\text{Diff} \times \text{Ari})(x) = 5$ $\{x \neq 1\}$

$\lim_{x \to 1} \frac{(x-1)}{1} \cdot \left(\frac{5}{x-1}\right)$ $\lim_{x \to 1} \frac{(x-1)}{(x-1)} \cdot \frac{5}{1} = \lim_{x \to 1} 5$

2.3/88

$\lim_{x \to \sqrt{2}} f(x^2) = ?$

IDK

$\lim_{x \to 1} f(x) = 4$

what is $\lim_{x \to 1} f(x^2)$

$\lim_{y \to 1} f(y) = 4$

$\lim_{z \to 1} f(z) = 4$

$\lim_{\heartsuit \to 1} f(\heartsuit) = 4$

As $x \to 1$ "as x approaches 1"

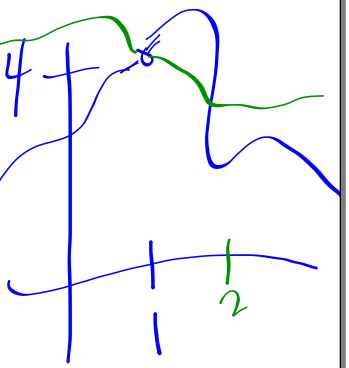
what happens to x^2? i.e $\lim_{x \to -1} x^2 = (-1)(-1) = +1$

As $x \to -1$, $x^2 \to +1$, which means that

as "stuff inside parentheses" $\to +1$

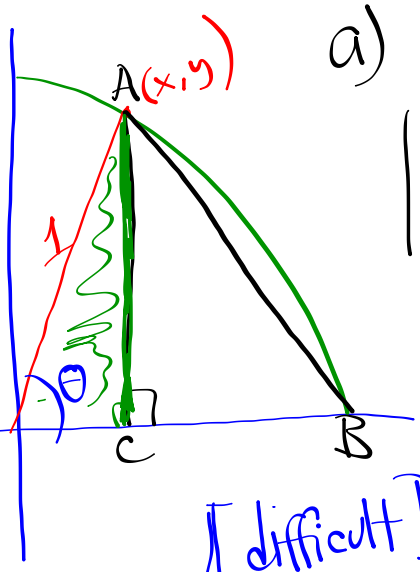
what is the limit of

$\lim_{\square \to 1} f(\square) = 4$



I could answer this if I knew $\lim_{x \to 2} f(x) = 6$

2.3/90)



a) show that

$|\overline{AC}| = |\sin\theta|$

$\sin\theta = \frac{opp}{hyp}$

$= \frac{m(\overline{AC})}{1}$

$= m(\overline{AC})$

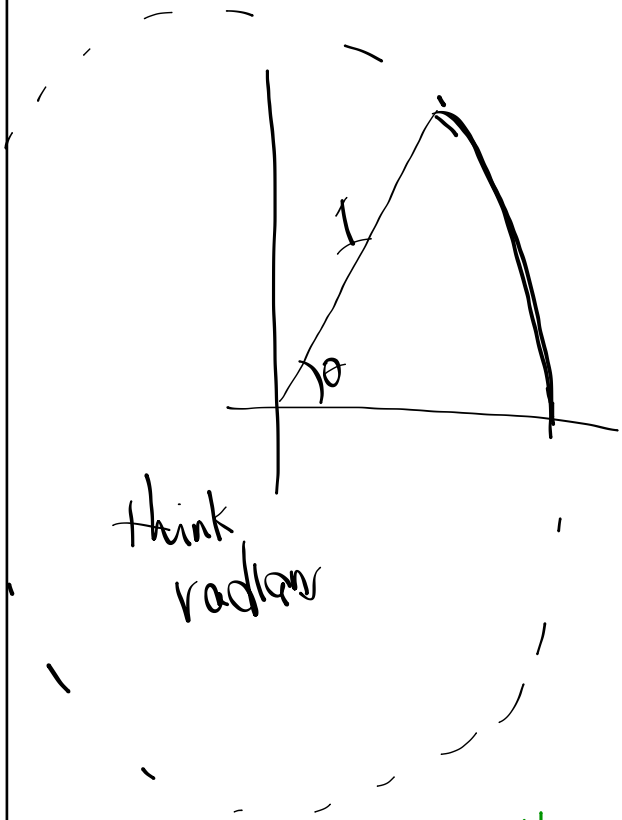
b) $|\sin\theta| < |\theta|$

arc length

[difficult]

$m\overset{\frown}{AB} < m\overline{AB} < m\overset{\frown}{AC}$

is the angle but also known as the arc length



think radians

$$\frac{\text{arc length}}{\text{circumference}} = \frac{\theta}{2\pi}$$

circumference $= 2\pi r$ for a unit $\odot$

circum... $= 2\pi(1) = 2\pi$

$$\frac{\text{arc length}}{2\pi} = \frac{\theta}{2\pi}$$

length of arc subtended by an angle of θ radians IN a unit circle IS θ

23/71 $x^n - a^n = (x-a)(x^{n-1} + x^{n-2}a + x^{n-3}a^2 + \dots + xa^{n-2} + a^{n-1})$

$$\lim_{x\to 1} \frac{x^6-1}{x-1} = \lim_{x\to 1} \frac{(x-1)(x^5+x^4(1)+x^3(1^2)+x^2(1^3)+x(1^4)+1^5)}{(x-1)}$$

$x^6 - 1 = x^6 - 1^6$

$x \to x$

$a \to 1$

$n = 6$

$$= \lim_{x\to 1} \frac{(x-1)(x^5+x^4+x^3+x^2+x+1)}{(x-1)}$$

$$= \lim_{x\to 1} (x^5+x^4+x^3+x^2+x+1) = 6$$